

REMARKS

Claims 1-19 are pending in the application. Claims 1, 5, 9 and 17-19 have been amended. Support for the amendments to these claims is found in FIG. 1 and FIG. 6 and in Col. 2-3 of the application as filed. No new matter has been introduced. Claim 6 has been canceled. Claims 1-5 and 7-19 have all been rejected. Applicant respectfully traverses the rejections and seeks favorable reconsideration in view of the following remarks.

The Examiner objected to the drawings under 37 CFR 1.83(a). Rule 1.83(a) provides that “[t]he drawing[s]...must show every feature of the invention specified in the claims.” The Examiner asserts that in view of Rule 1.83(a) “the plurality of drag pumping mechanism rotors attached to the turbomolecular pumping mechanism rotor as in claims 5-6 must be shown or the feature(s) canceled from the claim(s).” The Examiner requires “[c]orrected drawing sheets in compliance with 37 CFR 1.121 (d)...in reply to the Office action to avoid abandonment of the application.”

Applicant respectfully disagrees with the Examiner’s objection to the drawings. Nonetheless, Applicant has amended FIG. 1 and FIG. 6 in reply to the Office action as shown in the enclosed Replacement drawing sheets. Amended FIG. 1 and amended FIG. 6 show that the molecular drag pumping mechanism has a plurality of rotors 62a, 62b supported by the rotor blades 58a, 58b of the turbomolecular pumping mechanism as claimed in dependent claim 5. Accordingly, Applicant respectfully submits that the drawings, in particular amended FIG. 1 and FIG. 6, show every feature of the invention as claimed in dependent claim 5. Thus, Applicant respectfully requests withdrawal of the objection to the drawings.

Claims 9 and 17-19 are rejected under 35 U.S.C. § 112, second paragraph, “as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.” The Examiner asserts that claims 9 and 17-19 recite “‘the rotor,’ multiple times in reference to elements which have not been previously recited as having a rotor.” The Examiner concludes that claims 9 and 17-19 are “indefinite by the lack of antecedent basis of the recitations of ‘the rotor.’”

Applicant has amended claims 9 and 17-19 to claim “a second molecular drag pumping mechanism having a rotor, wherein the rotor of which the second molecular drag pumping mechanism is supported by the a rotor of a regenerative pumping exhausting mechanism.”

Accordingly, Applicant respectfully submits that the rejections of claims 9 and 17-19 under § 112, second paragraph, have been overcome and respectfully requests withdrawal of the rejections.

The Examiner rejected claims 1-9 and 13-19 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,135,709 (“Stones”). Section 102 provides that “[a] person shall be entitled to a patent unless - (b) the invention was patented or described in a printed publication in this or a foreign country..., more than one year prior to the date of application...” The Federal Circuit has held that “[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

The Examiner asserts that “Stones teaches a vacuum pumping arrangement comprising a turbomolecular pumping mechanism (50) having a rotor (9) with rotor blades (54), and a molecular drag pumping mechanism (2) connected in series (col. 3, In. 12-16) with the turbomolecular pumping mechanism (50), and that a rotor (9) of the molecular drag pumping mechanism (2) is supported by the rotor blades (54) of the turbomolecular pumping mechanism (50).”

Claim 1 has been amended to claim “a rotor of the molecular drag pumping mechanism is supported by affixed to the rotor blades of the turbomolecular pumping mechanism.” Stones discloses a vacuum pump having a Holweck (or molecular drag) section. The molecular drag stages (shown in FIG. 3) are mounted concentrically on the rotor 9, with the inner stages being shorter than the outer stages. Col. 3, Ln. 40-41; Col. 4, Ln. 1-2; FIG. 3. Mounted separately on the rotor 9, is the rotor body 52 “from which extend...rotor vanes 54...” for the turbomolecular section 50. Col. 2, Ln. 65-67; Col. 3, Ln. 1-3. Thus, Stones teaches that the rotor body 52 and the Holweck stages are mounted on rotor 9 and the rotor vanes 54 are mounted to the rotor body 52. Stones simply fails to disclose or even suggest that “a rotor of the molecular drag pumping mechanism is *affixed to* the rotor blades of the turbomolecular pumping mechanism” as claimed in amended independent claim 1 (emphasis added). Thus, Applicant respectfully requests withdrawal of the rejection to independent claim 1.

Claims 2-9 and 13-19 depend either directly or indirectly from amended independent claim 1. Accordingly, for at least the reasons set forth above with respect to amended

independent claim 1, claims 2-9 and 13-19 are not anticipated by Stones. Thus, Applicant respectfully requests withdrawal of the rejections to dependent claims 2-9 and 13-19.

In addition, the Examiner rejected dependent claim 5 as being anticipated by Stones. The Examiner asserts that “Stones teaches two Holweck type molecular drag pumping cylinders in Fig. 3, which, as they each provide an independent pumping action, may be considered a separate rotor, and thus together constitute a plurality of rotors.” Applicant has amended dependent claim 5 to claim that “the molecular drag pumping mechanism has a plurality of rotors supported by affixed to the rotor blades of the turbomolecular pumping mechanism.” Stones discloses that the molecular drag stages are mounted to the rotor 9. Col. 3, Ln. 40-41; Col. 4, Ln. 1-2; FIG. 3. Stones simply fails to disclose that the molecular drag stages (shown in FIG. 3) are “affixed to” the rotor vanes 54. Accordingly, Applicant respectfully submits that Stones fails to disclose each and every element claimed in amended dependent claim 5. Thus, for these further reasons, claim 5 is not anticipated by Stones.

The Examiner rejected dependent claim 6 as being anticipated by Stones. Applicant has canceled dependent claim 6 and thus, the rejection has been obviated.

The Examiner rejected dependent claim 9 as being anticipated by Stones. The Examiner asserts that “in Fig. 3, Stones teaches two distinct rotors of the molecular drag pumping mechanism (2), each of which is supported by the rotor (9), which is also the rotor of a regenerative pumping mechanism (1).” Applicant respectfully submits that while Stones may disclose two molecular drag rotors, Stones simply fails to disclose or even suggest “*a second molecular drag pumping mechanism...*” as claimed in amended dependent claim 9 (emphasis added). Accordingly, Stones fails to disclose each and every element claimed in amended dependent claim 9. Thus, for these further reasons, amended dependent claim 9 is not anticipated by Stones.

The Examiner rejected dependent claim 10 under 35 U.S.C. § 103(a) as being unpatentable over Stones in view of U.S. Patent No. 4,465,434 (“Rourk”). Section 103(a) provides that “[a] patent may not be obtained though the invention is not identically disclosed or described..., if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains...”

The Examiner concedes that “Stones does not teach the use of specific materials in his vacuum pump.” However, the Examiner claims that “it is known that turbomolecular and molecular drag pumps generate heat.” The Examiner asserts that “Rourk teaches a carbon fiber composite turbine wheel, and that the use of carbon fiber composites increases the temperature at which a rotor may operate.” The Examiner further asserts that Rourk teaches “‘interlaminar shear stress associated with load transfer from radial to circumferential is minimized,’ (col. 2, In. 3-5).” The Examiner concludes that “it would have been obvious...to form the rotor of the molecular drag pump of Stones from a carbon fiber composite as taught by Rourk in order to increase heat resistance and minimize interlaminar shear stress.” Applicant respectfully traverses the rejection and seeks favorable reconsideration in view of the following remarks.

As discussed above with respect to amended independent claim 1, Stones fails to teach that “a rotor of the molecular drag pumping mechanism is *affixed to* the rotor blades of the turbomolecular pumping mechanism” as claimed in amended independent claim 1, from which claim 10 depends (emphasis added). Accordingly, Applicant respectfully submits that even if Stones were combined with Rourk, the combination would not achieve the invention as claimed in dependent claim 10. Thus, Applicant respectfully requests withdrawal of the rejection to dependent claim 10 as being obvious.

Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stones in view of U.S. Patent No. 5,230,924 (“Schofield”). The Examiner concedes that “Stones does not teach the use of specific materials in his vacuum pump.” However, the Examiner asserts that “Schofield teaches that aluminum is generally useful for combined regenerative/Holweck pumps (col. 3, In. 26-29).” The Examiner concludes that “it would have been obvious...to use aluminum to form elements of the vacuum pump of Stones.” Applicant respectfully traverses the rejection and seeks favorable reconsideration in view of the following remarks.

As discussed above with respect to amended independent claim 1, Stones fails to teach that “a rotor of the molecular drag pumping mechanism is *affixed to* the rotor blades of the turbomolecular pumping mechanism” as claimed in amended independent claim 1, from which claims 11-12 depend (emphasis added). Accordingly, Applicant respectfully submits that even if Stones were combined with Schofield, the combination would not achieve the invention as claimed in dependent claims 11-12. Thus, Applicant respectfully requests withdrawal of the rejection to dependent claims 11-12 as being obvious.

The Office Action contains numerous statements reflecting characterizations about the invention(s), the claims, and the related art with which Applicant does not necessarily agree. Regardless of whether any such statement or characterization is discussed above, Applicants declines to subscribe to any statement or characterization in the Office Action.

Applicant has enclosed a request for a three-month extension of time. Applicant does not believe that any additional fee is due, but as a precaution, the Commissioner is hereby authorized to charge any additional fee to deposit account number 50-4244.

Respectfully Submitted,



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